

CLAIMS

1. A sliding door system for a vehicle with a vehicle body having a door opening and a sliding door (3), comprising a guide rail (1; 30; 33) which can be mounted on or in the vehicle body in the proximity of the door opening, a guide element (2) which is displaceable along the guide rail (1; 30; 33) and which is connected to the sliding door (3) by way of a holding arm (5; 32; 34), a line receiving means (15) of pivotably interconnected members (16) for receiving and guiding electric lines (20) from a connection on the vehicle body to a connection at the sliding door (3), wherein the line receiving means (15) is guided in a guide device, characterised in that the guide device for the line receiving means (15) is integrated into the guide rail (1; 30; 33) for the guide element (2) of the sliding door (3).

2. A sliding door system as set forth in claim 1 characterised in that the guide rail (1; 30) is arranged externally on or in the vehicle body in the region over which the sliding door (3) is moved when being opened and closed, and the holding arm (5; 32) is arranged in the rear end region of the sliding door (3), which is directed towards the tail of the vehicle.

3. A sliding door system as set forth in claim 1 characterised in that the guide rail (33) is arranged on or in the lower region of the vehicle body along the door opening and the holding arm (34) is arranged at the front end region of the sliding door (3), which is directed towards the front of the vehicle.

4. A sliding door system as set forth in claim 1 characterised in that the guide rail is arranged on or in the upper region of the vehicle body along the door opening and the holding arm is arranged at the front end region of the sliding door.

5. A sliding door system as set forth in one of claims 1 through 4 characterised in that the holding arm (5; 32; 34) has two arm portions which are connected together pivotably about a substantially vertical axis or is mounted pivotably to the sliding door (3).

6. A sliding door system as set forth in one of claims 1 through 5 characterised in that in its front end region which is directed towards the front of the vehicle the guide rail (30, 33) has a substantially horizontally extending curved region (31, 35).

7. A sliding door system as set forth in one of claims 1 through 6 characterised in that an end of the line receiving means (15) is connected to the guide element (2) by way of a connecting element.

8. A sliding door system as set forth in claim 6 and claim 7 characterised in that the connecting element is pivotable with respect to the guide element (2) about a substantially perpendicular axis.

9. A sliding door system as set forth in one of claims 1 through 8 characterised in that the electric lines (20) issuing from an end of the line receiving means are passed by way of the holding arm (5; 32, 34) to the sliding door (3).

10. A sliding door system as set forth in one of claims 1 through 9 characterised in that the guide rail (1; 30, 33) is of a channel-shaped configuration with an opening which extends in the longitudinal direction and through which the holding arm (5, 32, 34) extends, and the guide element (2) has at least one roller (11) which is arranged in the channel-shaped guide rail (1; 30; 33) rotatably about a substantially horizontal axis and is mounted to the holding arm (5; 32; 34).

11. A sliding door system as set forth in claim 8 and claim 10 characterised in that the line receiving means (15) has an end member

(17) which is connected by way of a loop-shaped portion to a part of the holding arm (32; 34) which extends into the guide rail (30; 33), and the loop-shaped portion is mounted pivotably about a substantially vertical axis at the end member (17) and/or at the part of the holding arm (32; 34) which extends into the guide rail (30; 33).

12. A sliding door system as set forth in one of claims 1 through 11 characterised in that provided at an end of the guide rail or the guide device, which is directed towards an end of the vehicle, is a deflection region for the line receiving means (15), by which it is deflected through a given angle in a given direction upon displacement in a direction towards the end of the vehicle, and connected to the deflection region is a channel-shaped guide in which the deflected portion of the line receiving means (15) extends as a first run (23), which is adjoined by a substantially semicircular arc (24) of a predetermined radius and adjoining which is a second run (25), the end of which is connected stationarily to the vehicle body.

13. A sliding door system as set forth in claim 12 characterised in that the deflection region for the line receiving means (15) is provided at the rear end, which is directed towards the tail of the vehicle, of the guide rail or the guide device, by which it is deflected through a given angle in a given direction upon displacement in a direction towards the tail of the vehicle.

14. A sliding door system as set forth in claim 12 or claim 13 characterised in that the means for deflection of the line receiving means (15) is the end of the guide rail, which is directed towards an end of the vehicle, or a channel-like or housing-like region (21a) of the guide device.

15. A sliding door system as set forth in one of claims 12 through 14 characterised in that deflection of the first run of the line receiving means (15) at the end of the guide rail or the guide device, which is directed

towards an end of the vehicle, is through about 90° or through about 120° to about 180°.

16. A sliding door system as set forth in one of claims 12 through 15 characterised in that the curvature of the deflection of the first run of the line receiving means (15) at the end of the guide rail or the guide device, which is directed towards an end of the vehicle, and the substantially semicircular deflection of the line guide means (15) between the first and second runs are in the same direction with respect to the longitudinal extent of the line guide means (15).

17. A sliding door system as set forth in one of claims 12 through 16 characterised in that the line receiving means (15) which is guided substantially horizontally in adjacent relationship with the sliding door is effected in the deflection region into a substantially vertical direction or into a direction opposite to the direction of movement of the sliding door which is to be opened.

18. A sliding door system as set forth in one of claims 12 through 17 characterised in that the channel-shaped guide is in the form of an elongate substantially parallelepipedic guide housing (22), in the one end of which there is provided an opening for the passage therethrough of the deflected portion of the line receiving means (15) and in which the respective outwardly facing sides of the runs (23, 25) are guided at two oppositely disposed longitudinal sides.

19. A sliding door system as set forth in one of claims 12 through 18 characterised in that the channel-shaped guide is arranged in a pillar of the vehicle body.

20. A sliding door system as set forth in one of claims 1 through 19 characterised by a drive device for moving the sliding door (3) along the guide rail (1; 30; 33).

21. A sliding door system as set forth in claim 20 characterised in that the drive device has a reversible motor arranged in the vehicle body and a pulling device which is driven by the motor and which in the longitudinal direction of the guide rail (1; 30; 33) is connected to the guide element (2) or the holding arm (5; 32; 34) and with which the guide element (2) or the holding arm (5; 32; 34) is displaceable along the guide rail (1; 30; 33) in both directions in dependence on the direction of rotation of the motor.

22. A sliding door system as set forth in claim 21 characterised in that the pulling means has two cable runs (28; 29) which are connected to a respective side of the guide element (2) or the holding arm (5; 32; 34) and which extend along the guide rail (1; 30; 33) and at the ends of which are deflected to a drive unit which exerts a pulling force on one cable run (28, 29) or the other, in dependence on the direction of rotation of the motor.

23. A sliding door system as set forth in claim 21 characterised in that the pulling means is formed by a toothed belt drivable by the motor by way of a pinion.

24. A sliding door system as set forth in one of claims 20 through 23 characterised in that the drive device has a motor arranged in the sliding door (3), a pinion driven by the motor and arranged on the holding arm and a row of teeth meshing with the pinion and extending along the guide rail (1; 30; 33).

25. A sliding door system as set forth in one of claims 1 through 24 characterised in that, to guide the sliding door, at least one second guide rail (7) is arranged on the vehicle body in the upper and/or lower region along the door opening, with a second guide element (8) which is displaceable along the second guide rail (7) and which is connected by way

of a second holding arm (9) to the front region of the sliding door (3), which is directed towards the front of the vehicle.

26. A sliding door system as set forth in one of claims 1 through 25 characterised in that the region (15a) of the line receiving means (15), which is arranged in adjacent relationship with the guide element (2), is displaced directly in the track of the guide element (2).